The Right Simulation Can Solve Rail Challenges – But Are You on Board with It?

Rail is entering a period of innovation, pressure, and expectation that it has never previously known.

In the UK and the EU, it is undergoing extensive operational changes with the rollout of the European Train Control System (ETCS), as part of the European Rail Traffic Management System (ERTMS). Objectives: improved safety, more and faster journeys, more cargo, more passengers, and all for the same amount of track.

Over in mainland Europe, high-speed rail travel is now officially in expansion mode, with cross-border travel set to become simpler, cheaper, faster, and more extensive by 2040 as a result of new European Commission proposals. Once again, more passengers, more journey...

Effective simulation technology is at the heart of success for all these high-stakes developments, and those involved in them: network operators, rail companies, engineering firms, train manufacturers, and academic rail institutions alike. Prototyping, testing, validating and training in the virtual world reduces the risk of failure in the physical world.

A realistic 3D visualisation of the railway network is central to this, with the ability to make rapid changes and repeat scenarios. However, there are several questions that need to be answered:

- How accurate and realistic can we make a 3D visualisation of the railway?
- How realistic does it need to be?
- How easily can we make changes, for example to trial alternative signalling schemes?

RapidRail: 3D visualisation for the digital railway

These are legitimate questions to ask because visualisation technology moves fast.

For the proof, look no further than the work we do in the rail sector: it focuses on using the latest technology from the games domain to enable designers, innovators and researchers to dynamically create realistic 3D environments, link those 3D worlds to powerful railway simulations and visualise scenarios in a realistic and intuitive way.

Take our RapidRail tool, for example. It's a fully customisable solution for augmenting new and existing simulations with beautiful 3D visuals. It's also one that puts the vital Driver right in the hot seat of the visualisation experience – quite literally, as it shows the view from the driver's cab!

And going back to the need for realism, RapidRail uses technology developed in the games industry to provide users with an immersive visual experience that's strong on detail, and enables authentic environments to be created in minutes, using standard, off-the-shelf, PC hardware.

High-quality visual output - for ERTMS planning, infrastructure design, training, and traffic optimisation - is therefore now achievable in an existing simulation environment for relatively little effort, and at low cost.

It's a compelling proposition for those who use rail simulation or see the benefits but are yet to find the right solution.

Agility3: trusted in the rail industry

At Agility3, our 3D visualisation solutions have underpinned some truly transformative rail industry projects and initiatives.

ProRail

Dutch railway network organisation ProRail lacked a driver view "out of the cab" that would demonstrate how real-world features appear or behave differently as a result of changes to procedures and schedules driven by ERTMS.

ProRail chose Agility3 to design and deliver a bespoke 3D visualisation solution to fill this need.

The solution auto-generates 3D rail networks directly from ProRail's data and enables the rail networks to be visualised from the perspective of the train driver.

> "Agility3 were willing and able to understand the needs of ProRail, and, through their expertise in developing high-performance 3D visualisations, translate these needs into usable solutions. Tight deadlines were always met and Agility3 are very easy to work with."

BCRRE

World-renowned rail research institution BCRRE approached Agility3 to upgrade their simulation system and incorporate enhanced in-cab visuals.

The solution we delivered reads track data exported from the simulator and automatically positions signals, platforms and track equipment.

Intuitive tools enable the BCRRE team to rapidly define the trackside environment and generate the view from the cab in as much detail as required to support their research objectives.

> "Collaborating with Agility3 has enabled our train driving simulation to advance to the next level."

Others

VirtuRail (Transport for London) – We developed an interactive 3D visualisation application for TfL's Railway Engineering Simulator (RES), enabling users to see exactly what is happening in the simulated world and gain greater insight.

Virtual Route Viewer – We built a Windows application to visualise and navigate highly accurate 4D virtual railway environments, comparing existing schemes with proposed updates for rail infrastructure development projects, and enabling stakeholders to generate feedback earlier and reduce programme risk.

This has been used on various other Network Rail projects including the Liverpool Lime Street capacity project, Midlands MainLine Electrification and the refurbishment of numerous stations.

Rail Experience Demonstrator (Transport for London) – The immersive, virtual reality, in-train and in-station experience we developed is used to showcase the capabilities of VR and support PR and recruitment.

What's the next stop?

For us, it's another exciting 3D rail visualisation project, this time with market-leading French safety software specialist Clearsy (watch this space!)

For you, is it time to get on board with something that takes you further, faster?

For more information on our 3D visualisation solutions for rail, get in touch.

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